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NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER	
PATEL, MAHENDRA R	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/571,606	MEIRICK ET AL.	
	Examiner	Art Unit	
	MAHENDRA PATEL	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _18 May 2010_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-29_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-29_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

This communication is in response to the Pre-Brief filed on 05/18/2010.
Application No: 10/571,606.

Claims 1-29 are pending.
Claims 1-29 are amended by the applicant.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 9, 10, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term “completed packet” and/or ‘Size of data packet segment” is indefinite with regard to the technical features to which they refer (i.e. without referring or disclosing the length of a packet or header information including size of the packet, or number of segments in a packet, a packet cannot be transmitted successfully or be assembled completely); and thereby rendering the definition of the subject matter of said claims unclear. A proper correction is required to overcome the 112 rejections.

Response to Arguments

3. An examiner’s Response to the record appears below.

4. Applicant's arguments with respect to claims 1-29 have been considered but they but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 1-29 are** rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (US 20020068588 A1) in view of Muller et al. (US 6480489 B1), and further in view of Jason et al. (US 20030076850 A1).

7. **Regarding claim 1**, Yoshida teaches a method of managing a data buffer comprising a queue of consecutive data packets in a base station system of a mobile communications system ([0014] (e.g. A buffer for temporarily storing (i.e. queuing) packets received from the packet transfer apparatus [0015] a packet transfer apparatus connected between the base stations and a communication network)), comprising the step of:

Yoshida differ from the claimed invention in not specifically teaching said base station system comparing a size of a data packet segment with a size of a next consecutive data packet segment in said buffer.

However, in the same field of endeavor, Muller teaches a method for comparing a size of a data packet segment with a size of a next consecutive data packet segment in said buffer ([Col 42, lines 5-10] (e.g. Header parser 106 in one embodiment of the invention is configured to compare the size of each packet's data portion (I.e. comparing a size of a data packet segment with a size of a next consecutive data packet segment) to a pre-selected value)).

Muller further teaches Said base station system identifying a complete data packet in said buffer based on said comparison ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion)).

Yoshida and Muller differ from the claimed invention in not specifically teaching said base station system discarding said identified complete data from the said buffer.

However, in the same field of endeavor, Jason teaches a method for discarding said identified complete data from the said buffer ([0004] (e.g. until the reassembly timer for the datagram has expired and the fragments are discarded)).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the method of Jason and Muller within the method of Yoshida to provide improve buffer management in a radio communication system. The combined method provides

efficiently retransmitting a packet, specifically, an automatic repeat request (ARQ) method for providing efficient buffer management and efficient scheduling, and hence provides better networking performance.

Regarding claim 2, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 1. Muller further teaches the method wherein said identifying step comprises the steps of:

identifying said next data packet segment as a first data packet segment of said complete data packet in said buffer if said size of said data packet segment is smaller than said size of said next data packet segment ([Col 41, lines 60-64] (e.g. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. The last packet will hold the remainder, usually causing it to be smaller than the MTU (i.e. following last segment, the next data packet segment is identified as a first data packet segment). ([Col 41, lines 65-68] (e.g. Therefore, one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion)).

Jason further teaches associating said identified first data packet segment with a first segment identifier ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (i.e. associating said identified first data packet segment))).

Regarding claim 3, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 1. Muller further teaches the method wherein said identifying step comprises the steps of:

identifying said next data packet segment as a last data packet segment of said complete data packet in said buffer if said size of said data packet segment differs from said size of said next data packet segment ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data (i.e. a last data packet segment) in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion)).

Jason further teaches associating said identified last data packet segment with a last segment identifier ([0021] (e.g. The data classification module 64 analyzes the header encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. identified last data packet segment) of a packet)).

Regarding claim 4, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 2. Jason further teaches the method wherein said discarding step comprises the step of discarding said data packet segment associated with said first segment identifier, said data packet segment associated with said last segment identifier and any intermediate data packet segments between said data packet segment associated with said first segment identifier and said data packet segment associated with said last segment identifier in said buffer ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30,

but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier). These fragments 29 are cached at the receiving point 24 until all of the fragments 29 of the packet have been received or until the reassembly timer for the datagram has expired and the fragments are discarded. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate data packet segments) encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier) of a packet)).

Regarding claim 5, this is a system claim which is analogous to the method claim 1. Yoshida further teaches electronic circuitry ([0035] (e.g. FIG. 19 is a block diagram showing an example of the hardware configuration of a base station)). Therefore the same rejections and citations of claim 1 apply.

Regarding claim 6, this is a system claim which is analogous to the method claim 2. Yoshida further teaches electronic circuitry ([0035] (e.g. FIG. 19 is a block diagram showing an example of the hardware configuration of a base station)). Therefore the same rejections and citations of claim 2 apply.

Regarding claim 7, this is a system claim which is analogous to the method claim 3. Yoshida further teaches electronic circuitry ([0035] (e.g. FIG. 19 is a block diagram showing an example of the hardware configuration of a base station)). Therefore the same rejections and citations of claim 3 apply.

Regarding claim 8, this is a system claim which is analogous to the method claim 4. Yoshida further teaches electronic circuitry ([0035] (e.g. FIG. 19 is a block diagram showing an example of the hardware configuration of a base station)). Therefore the same rejections and citations of claim 4 apply.

example of the hardware configuration of a base station)). Therefore the same rejections and citations of claim 4 apply.

Regarding claim 9, this is a network node system claim which is analogous to the method claim 1. Yoshida further teaches a network node ([0008] (e.g. On the other hand, by providing a buffer at a node separate from the base stations, the packet dropout can be prevented)).

Jason further teaches a data buffer comprising a queue of consecutive segments of data packets ([0022] (e.g. The data packets are then queued and scheduled for sending according to a policy, using a queuing and scheduling module)).

Yoshida further teaches a system for managing said data buffer ([0085] (e.g. a packet management table 1107 holds a list of packets stored in the buffer 1103)). Therefore the same rejections and citations of claim 1 apply.

Regarding claim 10, this is a method claim which is analogous to the method claim 1. Muller further teaches a method for enabling identification of a complete data packet in a data buffer ([Col 42, lines 13-16] (e.g. Thus, in state 620, flow database manager 108 determines whether the received packet appears to carry the final portion of data (I.e. identification of a complete data packet) for the flow's datagram)). Therefore the same rejections and citations of claim 1 apply.

Regarding claim 11, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 10. Muller further teaches the method further comprising the step of providing a segment counter associated with a data packet segment in said buffer ([Col 38, lines 32-42] (e.g. for the first packet received after NIC 100 is initialized, a flow activity

counter may be incremented to the value of one. This value may then be stored in flow activity indicator 524 for the associated flow. The next packet received as part of the same (or a new) flow causes the counter to be incremented to two, which value is stored in the flow activity indicator for the associated flow. In this example, no two flows should have the same flow activity indicator except at initialization, when they may all equal zero or some other predetermined value)).

Regarding claim 12, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 11. Muller further teaches the method further comprising the steps of:

comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches identifying said next data packet segment as a first data packet segment of said complete data packet in said buffer if said size of said data packet segment associated with said counter is smaller than said size of said next data packet segment ([Col 41, lines 60-64] (e.g. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. The last packet will hold the remainder, usually causing it to be smaller than the MTU. ([Col 41, lines 65-68] Therefore, one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected

to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Regarding claim 13, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 12. Muller further teaches the method further comprising the steps of:

(a) comparing a size of the data packet segment currently associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches (b) associating said counter with said next data packet segment if said size of the data packet segment currently associated with said counter is equal to or larger than said size of said next data packet segment [Col 41, lines 60-64] (e.g. The typical manner of disseminating a datagram among multiple packets is to put as much data as possible into each packet. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Jason further teaches repeating both said comparison step (a) and said associating step (b) until said size of the data packet currently associated with said counter is smaller than said size of said next data packet segment, whereby said next data packet segment is identified as a first data packet segment of said complete data packet in said buffer ([0016] (e.g. After receiving the packets, the receiving interface device 40 analyzes the fragments to determine their sizes (616). If the fragment being analyzed is the last fragment in a packet (step 618), the size is checked to see if it is greater than the path MTU (as are non-fragmented datagrams). If so, the path MTU is changed. If it is not larger than the path MTU, then the path MTU is not changed as it most likely that the last fragment (I.e. last data packet segment of said complete data packet) will be smaller than the path MTU (i.e. following last segment, the next data packet segment is identified as a first data packet segment))).

Regarding claim 14, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 12. Muller further teaches the method further comprising the step of associating said segment counter with said first data packet segment of said complete data packet ([Col 38, lines 32-42] (e.g. for the first packet received after NIC 100 is initialized, a flow activity counter may be incremented to the value of one. This value may then be stored in flow activity indicator 524 for the associated flow)).

Regarding claim 15, Yoshida in view of Muller and further in view of Jason teaches all he limitations of clam 14. Muller further teaches the method further comprising the steps of:

comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and

compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches identifying said next data packet segment as a last data packet segment of said complete data packet in said buffer if said size of said data packet segment associated with said counter differs from said size of said next data packet segment ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data (i.e. a last data packet segment) in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Regarding claim 16, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 15. Jason further teaches the method wherein said complete data packet is identified as comprising said first data packet segment of said complete data packet, said last data packet segment of said complete data packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier). These fragments 29 are cached at the receiving point 24 until all (i.e. complete data packet) of the fragments 29 of the packet have been received. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate data packet) encapsulated with

the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier for complete data)) of a packet)).

Regarding claim 17, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 15. Muller further teaches the method further comprising the steps of:

determining a total size of said first data packet segment of said complete data packet, said last data packet segment of said complete data packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer ([Col 42, lines 52-62] (e.g. The new flow sequence number is determined by adding the size of the newly received data to the existing flow sequence number. Depending upon the configuration of the packet (e.g., values in its headers), this sum may need to be adjusted. For example, this sum may indicate simply the total amount of data received thus far for the flow's datagram)).

Muller further teaches comparing said total size with a minimum size threshold ([Col 43, lines 65-68] (e.g. this determination may be made on the basis of control information received by the flow database manager from the header parser. If more data is expected (e.g., the amount of data in the packet equals or exceeds a threshold value)).

Jason further teaches identifying said complete data packet as comprising said first data packet segment of said complete data packet, said last data packet segment of said complete data packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header

34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier). These fragments 29 are cached at the receiving point 24 until all (i.e. complete data packet) of the fragments 29 of the packet have been received. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate data packet) encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier for complete data)) of a packet)).

Muller further teaches if said total size is larger than said minimum size threshold ([Col 43, lines 65-68] (e.g. If more data is expected (e.g., the amount of data in the packet equals or exceeds a threshold value)).

Regarding claim 18, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 11. Muller further teaches the method further comprising the steps of: comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn)).

Muller further teaches identifying said next data packet segment as a last data packet segment of said complete data packet in said buffer if said size of said data packet segment associated with said counter differs from said size of said next data packet segment [Col 41, lines

60-64] (e.g. Thus, each packet except the last (i.e. last differs from said size of said next data packet) is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Regarding claim 19, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 11. Muller further teaches the method further comprising the steps of:

(c) comparing a size of the data packet segment currently associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches (d) associating said counter with said next data packet segment if said size of the data packet segment currently associated with said counter is equal to said size of said next data packet segment [Col 41, lines 60-64] (e.g. The typical manner of disseminating a datagram among multiple packets is to put as much data as possible into each packet. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-35] the flow

activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Jason further teaches repeating both said comparison step (c) and said associating step (d) until said size of the data packet segment currently associated with said differs from said size of said next data packet segment, whereby said next data packet segment is identified as a last data packet segment of said complete data packet in said buffer ([0016] (e.g. After receiving the packets, the receiving interface device 40 analyzes the fragments to determine their sizes (616). If the fragment being analyzed is the last fragment in a packet (step 618), the size is checked to see if it is greater than the path MTU (as are non-fragmented datagrams). If so, the path MTU is changed. If it is not larger than the path MTU, then the path MTU is not changed as it most likely that the last fragment (I.e. last data packet segment of said complete data packet) will be smaller than the path MTU)).

Regarding claim 20, Yoshida teaches a system for enabling identification of a complete data packet in a data buffer comprising a queue ([0014] (e.g. A buffer for temporarily storing (i.e. queuing) comprising:

Yoshida differ from the claimed invention in not specifically teaching of consecutive data packet segments.

However, in the same field of endeavor, Jason teaches a method for consecutive data packet segments ([0016] (e.g. If the packet is larger than the path MTU, the packet is fragmented (I.e. segmented) as it is sent to the receiving interface device. After receiving the packets, the receiving interface device analyzes the fragments to determine their sizes)).

Yoshida and Jason differ from the claimed invention in not specifically teaching means for comparing a size of a data packet segment with a size of a next consecutive data packet segment in said buffer.

However, in the same field of endeavor, Muller teaches a method for comparing a size of a data packet segment with a size of a next consecutive data packet segment in said buffer ([Col 42, lines 5-10] (e.g. Header parser 106 in one embodiment of the invention is configured to compare the size of each packet's data portion (I.e. comparing a size of a data packet segment with a size of a next consecutive data packet segment) to a pre-selected value)).

Muller further teaches means for identifying said complete data packet based on said comparison ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion)).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the method of Jason and Muller within the method of Yoshida to provide improve buffer management in a radio communication system. The combined method provides efficiently retransmitting a packet, specifically, an automatic repeat request (ARQ) method for providing efficient buffer management and efficient scheduling, and hence provides better networking performance.

Regarding claim 21, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 20. Muller further teaches the system comprising means for associating a segment counter with a data packet segment in said buffer ([Col 38, lines 32-42] (e.g. for the first

packet received after NIC 100 is initialized, a flow activity counter may be incremented to the value of one. This value may then be stored in flow activity indicator 524 for the associated flow. The next packet received as part of the same (or a new) flow causes the counter to be incremented to two, which value is stored in the flow activity indicator for the associated flow. In this example, no two flows should have the same flow activity indicator except at initialization, when they may all equal zero or some other predetermined value)).

Regarding claim 22, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 21. Muller further teaches the system wherein said comparison means is adapted for comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches wherein said identifying means is adapted for identifying said next data packet segment as a first data packet segment of said complete data packet in said buffer if said size of said data packet segment associated with said counter is smaller than said size of said next data packet segment ([Col 41, lines 60-64] (e.g. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. The last packet will hold the remainder, usually causing it to be smaller than the MTU. ([Col 41, lines 65-68] Therefore, one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a

figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Regarding claim 23, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 21. Muller further teaches the system wherein said comparison means is adapted for comparing a size of the data packet segment currently associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches wherein said associating means is adapted for associating said counter with said next data packet segment if said size of the data packet segment currently associated with said counter is equal to or larger than said size of said next data packet segment [Col 41, lines 60-64] (e.g. The typical manner of disseminating a datagram among multiple packets is to put as much data as possible into each packet. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Jason further teaches said comparison means is adapted for repeating said size comparison and said associating means is adapted for repeating said counter association until said size of the data packet segment currently associated with said counter is smaller than said size of said next data packet segment whereby said identifying means is adapted for identifying said next data packet segment as a first data packet segment of said complete data packet in said buffer ([0016] (e.g. After receiving the packets, the receiving interface device 40 analyzes the fragments to determine their sizes (616). If the fragment being analyzed is the last fragment in a packet (step 618), the size is checked to see if it is greater than the path MTU (as are non-fragmented datagrams). If so, the path MTU is changed. If it is not larger than the path MTU, then the path MTU is not changed as it most likely that the last fragment will be smaller than the path MTU)).

Regarding claim 24, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 22. Muller further teaches the system wherein said associating means is adapted for associating said segment counter with said first data packet segment of said complete data packet ([Col 38, lines 32-42] (e.g. for the first packet received after NIC 100 is initialized, a flow activity counter may be incremented to the value of one. This value may then be stored in flow activity indicator 524 for the associated flow)).

Regarding claim 25, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 24. Jason further teaches the system wherein said comparison means is adapted for comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer , wherein said identifying means is adapted for identifying said next data packet segment as a last data packet segment of

said complete data packet in said buffer if said size of said data packet segment associated with said counter differs from said size of said next data packet segment ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier). These fragments 29 are cached at the receiving point 24 until all (i.e. complete data packet) of the fragments 29 of the packet have been received. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate data packet) encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier for complete data)) of a packet)).

Regarding claim 26, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 25. Jason further teaches the system wherein said identifying means is adapted for identifying said complete data packet as comprising said first data packet segment of said complete data packet, said last data packet segment of said complete data packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier). These fragments 29 are cached at the receiving point 24 until all (i.e. complete data packet) of the fragments 29 of the packet have been received. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate data packet) encapsulated with the data to determine whether the data is a packet or a fragment,

and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier for complete data)) of a packet)).

Regarding claim 27, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 25. Muller further teaches the system further comprising means for determining a total size of said first data packet segment of said complete data packet ([Col 42, lines 52-62] (e.g. The new flow sequence number is determined by adding the size of the newly received data to the existing flow sequence number. Depending upon the configuration of the packet (e.g., values in its headers), this sum may need to be adjusted. For example, this sum may indicate simply the total amount of data received thus far for the flow's datagram)).

Jason further teaches said last data packet segment of said complete data packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier). These fragments 29 are cached at the receiving point 24 until all (i.e. complete data packet) of the fragments 29 of the packet have been received. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate data packet) encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier for complete data)) of a packet)).

Muller further teaches said comparison means is adapted for comparing said total size with a minimum size threshold ([Col 43, lines 65-68] (e.g. this determination may be made on

the basis of control information received by the flow database manager from the header parser. If more data is expected (e.g., the amount of data in the packet equals or exceeds a threshold value)).

Muller further teaches and said identifying means is adapted for identifying said complete data packet as comprising said first data packet segment of said complete data packet, said last data packet segment of said complete data packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer if said total size is larger than said minimum size threshold ([Col 42, lines 52-62] (e.g. The new flow sequence number is determined by adding the size of the newly received data to the existing flow sequence number. Depending upon the configuration of the packet (e.g., values in its headers), this sum may need to be adjusted. For example, this sum may indicate simply the total amount of data received thus far for the flow's datagram. ([Col 43, lines 65-68] (e.g. this determination may be made on the basis of control information received by the flow database manager from the header parser. If more data is expected (e.g., the amount of data in the packet equals or exceeds a threshold value)).

Regarding claim 28, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 21. Muller further teaches the system wherein said comparison means is adapted for comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer , wherein said identifying means is adapted for identifying said next data packet segment as a last data packet segment of said complete data packet in said buffer if said size of said data packet segment associated with said counter differs from said size of said next data packet segment [Col 41, lines 60-64] (e.g. Thus,

each packet except the last (i.e. last differs from said size of said next data packet) is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Regarding claim 29, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 21. Muller further teaches the system wherein said comparison means is adapted for comparing a size of the data packet segment currently associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches wherein said associating means is adapted for associating said counter with said next data packet segment if said size of the data packet segment currently associated with said counter is equal to said size of said next data packet segment [Col 41, lines 60-64] (e.g. The typical manner of disseminating a datagram among multiple packets is to put as much data as possible into each packet. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Jason further teaches said comparison means is adapted for repeating said size comparison and said associating means is adapted for repeating said counter associating until said size of the data packet segment currently associated with said counter differs from said size of said next data packet segment , whereby said identifying means is adapted for identifying said next data packet segment as a last data packet segment of said complete data packet in said buffer ([0016] (e.g. After receiving the packets, the receiving interface device 40 analyzes the fragments to determine their sizes (616). If the fragment being analyzed is the last fragment in a packet (step 618), the size is checked to see if it is greater than the path MTU (as are non-fragmented datagrams). If so, the path MTU is changed. If it is not larger than the path MTU, then the path MTU is not changed as it most likely that the last fragment (I.e. last data packet segment of said complete data packet) will be smaller than the path MTU)).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahendra Patel whose telephone number is 571-270-7499. The examiner can normally be reached on 9:30 AM to 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, V. Paul Harper can be reached on 571-272-7605. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/MAHENDRA R PATEL/
Examiner, Art Unit 2617

/VINCENT P. HARPER/
Supervisory Patent Examiner, Art Unit 2617